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# MEMORY MAP STANDARD SYSTEMS



DMX\_16, DMX\_19, DMX\_20, DMX\_30R, DMX\_30S , DMX\_32  
GTP\_64, GTP\_128, TSP\_128, VTP\_322, VTP\_402  
VTP\_403, VTP\_804

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## USER MANUAL

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# 1 MEMORY MAP

To have a proper full picture on how the PC and how to work with this object, it's appropriate to give some general information about the software :

## 1.1 Memory Map

The PLC has 1024 16-bit internal memory locations (WORD) called DATA\_ These locations are intended to contain program variables running and are named from DATA\_00 to DATA\_1023. These locations are visible and shared both by the PLC side and on the terminal side and can therefore be read and written by both.

### 1.1.1 32 Bit Operations

32-bit operations : the operations on data memory are usually 16 bits, i.e. the size of the same date. However, it's possible to obtain the need for larger dimensions (long 32-bit variables) : these numerical values are stored in two consecutive DATA (lower = most significant word address, the highest word address = least significant). Operations that act between long variables are preceded by the 'L' prefix and take account of this format automatically, so for example:

- LMOV # 1234, DATA\_12 entered as 0 in DATA\_12 leasing and 1234 in the location DATA\_13
- LMOV # 65537, DATA\_12 places the value 1 in DATA\_12 leasing and 1 in the location DATA\_13

### 1.1.2 Buffered RAM

Considering that the E<sup>2</sup>PROM has a finite number of maximum writes stated by the manufacturer (approximately 100.000) to cope with the need for frequent and numerous savings has been provided a memory area dedicated to buffered RAM. The location from DATA\_432 to DATA\_511 are automatically copied in time clock's buffered RAM every 100 msec and re-load at switch-on time with the last memorized value. The RAM is buffered with a rechargeable battery, the battery life is 1 year with full charge, if the PLC is turned off for a longer time the data may be lost. The buffered RAM is always enable and doesn't need any enabling.

### 1.1.3 Eeprom

The locations from DATA\_512 to DATA\_1023 are automatically copied to external EEPROM if written from the terminal side and are therefore not volatile, the PLC on again resume the last stored value. The control end you can save the value in EEPROM with a simple command.

DATA_00	Current page number
DATA_01	Word of commands exchange between operator panel/PLC : <ul style="list-style-type: none"> <li>- Bit 0 : activate by PLC for signalling, but not show, the alarms</li> <li>- Bit 1 : activate by PLC for showing directly the alarms</li> <li>- Bit 2 : activate by Operator Panel in display alarm mode</li> <li>- Bit 3 : activate by Operator Panel in variables input mode</li> <li>- Bit 8 : activate by PLC, carry out the Pipeline transfer from COM 0 to COM 1</li> <li>- Bit 9 : activate by PLC, carry out the Pipeline transfer from COM 1 to COM 0</li> <li>- Bit 10 : printing of the current page (only for operator panels with two serial ports and PRINTER protocol)</li> <li>- Bit 11 : enable reading/writing variables <ul style="list-style-type: none"> <li>- Bit 12 : activate by PLC for reading command of a data memory on COM_1 (only VT with two serial ports)</li> <li>- Bit 13 : activate by PLC for writing command of a data memory on COM_1 (only VT with two serial ports)</li> </ul> </li> <li>- Bit 14 : activate by PLC for read a recipe</li> <li>- Bit 15 : activate by PLC for write a recipe</li> </ul>
DATA_02/03	Word of activation panel leds . (F_1 = DATA_02 - Bit 0 ...)
DATA_04/05	Word of activation blink of panel leds (F_1 = DATA_04 - Bit 0 ...)
DATA_06	Word alarm activation ALL_015..ALL_000 NB: ALL_0; ALL_1; ALL_2; ALL_3 are dedicated to communication errors

...	
DATA_21	Word alarm activation ALL_240..ALL_255
DATA_22	Block Number / Start Eeprom
DATA_23	Block Start / End Eeprom
DATA_24	Block Dimension
DATA_25	Word press buttons : <ul style="list-style-type: none"> <li>- Bit 0 : ENTER</li> <li>- Bit 1 : CLEAR</li> <li>- Bit 2 : UP</li> <li>- Bit 3 : DOWN</li> <li>- Bit 4 : Left</li> <li>- Bit 5 = RIGHT</li> <li>- Bit 6 = ALARM</li> <li>- Bit 7 = INFO</li> <li>- Bit 8 = PRG</li> <li>- Bit 9 = KER</li> </ul>
DATA_26	Word press buttons (F_1 = DATA_26 - Bit 0 ...)
DATA_27	Word press buttons (F_17 = DATA_26 - Bit 0 ...)
DATA_28	Word press buttons (0...9)
DATA_29	Last modify variable address
DATA_30	Real Time Clock current date/hour
DATA_31	Real Time Clock current date/hour
DATA_32	Real Time Clock current date/hour
DATA_33	Data exchange for COM_0 reading : external PLC address
DATA_34	Data exchange for COM_0 reading : memory to read address
DATA_35	Data exchange for COM_0 reading : number of data memory to read
DATA_36	Data exchange for COM_0 reading : read data ( single read )
DATA_37	Data exchange for COM_0 reading : read data block pointer ( multi read )
DATA_38	Data exchange for COM_0 reading : memory to write address
DATA_39	Data exchange for COM_0 reading : data to write ( only single write )
DATA_40	Data exchange for COM_1 reading : external PLC address
DATA_41	Data exchange for COM_1 reading : memory to read address
DATA_42	Data exchange for COM_1 reading : number of data memory to read
DATA_43	Data exchange for COM_1 reading : read data ( single read )
DATA_44	Data exchange for COM_1 reading : read data block pointer ( multi read )
DATA_45	Data exchange for COM_1 reading : memory to write address
DATA_46	Data exchange for COM_1 reading : data to write ( only single write )
DATA_47	Data exchange for COM_2 reading : external PLC address
DATA_48	Data exchange for COM_2 reading : memory to read address
DATA_49	Data exchange for COM_2 reading : number of data memory to read
DATA_50	Data exchange for COM_2 reading : read data ( single read )
DATA_51	Data exchange for COM_2 reading : read data block pointer ( multi read )
DATA_52	Data exchange for COM_2 reading : memory to write address
DATA_53	Data exchange for COM_2 reading : data to write ( only single write )
DATA_54	Field strength value of the GSM modem signal [00..99]

DATA_55	Seconds of the Real Time Clock (only if SYS_18 and SYS_12 are active)
...	...
DATA_60	Fast counter for generation of electronic cams
DATA_61	Slow counter for generation of electronic cams
DATA_64	Fast counter at 1 millisecond n. 0 (enabled from SYS_64)
...	...
DATA_71	Fast counter at 1 millisecond n. 7 (enabled from SYS_71)
...	...
DATA_80	Activation motor for PM 100. If DATA_80 = 16383 [dec] motor ON, if DATA_80 = 0 motor OFF
DATA_81	Duty Cycle out PWM 0 - 14 bit [0000..16383]. If DATA_81 = 0 = D.C 0% ; if DATA_80 = 16383 = D.C 100%
DATA_930...DATA_944	Area code from which it received the SMS (phone number of the SMS sender)
DATA_945...DATA_959	Area code for sending SMS (telephone number to send SMS)
DATA_958	Derivative coefficient PID motor controller channel 0 (cc and ca)
DATA_959	Integral coefficient PID motor controller channel 0(cc and ca)
DATA_960	Acceleration PID motor controller channel 0 (cc and ca)
DATA_961	Maximum speed PID motor controller channel 0 (cc and ca)
DATA_962 / 963	Bandwidth PID motor controller channel 0 (cc and ca)
DATA_964	Number of pulses of delay at the stop of the function step_offset Step Motor Control 1
DATA_965	Number pulse deceleration ramp Step Motor Control 1
DATA_966	Number pulse acceleration ramp Step Motor Control 1
DATA_967	Maximum pulse frequency Step Motor Control 1
DATA_968 / 969	Target number of steps Step Motor Control 1
DATA_970 / 971	Current number of steps Step Motor Control 1
DATA_974	D/A converter output value chan 2 [0..255] for MX_44
DATA_975	D/A converter output value chan 3 [0..255] for MX_44
DATA_976	Value reckoned from PID chan 0 [0..255]
DATA_977	Value reckoned from PID chan 1 [0..255]
DATA_978	PWM Base Time generator chan 0
DATA_979	PWM Duty Cycle generator chan 0
DATA_980	PWM Base Time generator chan 1
DATA_981	PWM Duty Cycle generator chan 1
DATA_982	Preset value 0 electronic cams generator
DATA_983	Preset value 1 electronic cams generator
DATA_985	Impulse number develop ramp step motor control
DATA_986	Impulse number envelop ramp step motor control
DATA_987	Impulse Maximum Frequency step motor control
DATA_988/989	Steps target number step motor control
DATA_990/991	Current step number step motor control
DATA_992/993	Preset Encoder 0
DATA_994/995	Current value Encoder 0

DATA_996/997	Preset Encoder 1
DATA_998/999	Current value Encoder 1
DATA_1004	Alarm threshold PID regulator channel 0
DATA_1005	Alarm threshold PID regulator channel 1
DATA_1006	Derivative time PID regulator channel 0
DATA_1007	Derivative time PID regulator channel 1
DATA_1008	Integral time PID regulator channel 0
DATA_1009	Integral time PID regulator channel 1
DATA_1010	Regulation band PID regulator channel 0
DATA_1011	Regulation band PID regulator channel 1
DATA_1012	Cycle time PID regulator channel 0
DATA_1013	Cycle time PID regulator channel 1
DATA_1014	Set Point temperature PID regulator channel 0
DATA_1015	Set Point temperature PID regulator channel 1
DATA_1016	Temperature PID regulator channel 0
DATA_1017	Temperature PID regulator channel 1
DATA_1018	Output value D/A converter channel 0 [0...255]
DATA_1019	Output value D/A converter channel 1 [0...255]
DATA_1020	Analogic reading value 10 bits channel 0 [0..1023]
DATA_1021	Analogic reading value 10 bits channel 1 [0..1023]
DATA_1022	Analogic reading value 10 bits channel 2 [0..1023]
DATA_1023	Analogic reading value 10 bits channel 3 [0..1023]
...	...
10000	Current value inputs INP_15..INP_00
11000	Current value outputs OUT_15..OUT_00
12000	Current value flags FLAG_15..FLAG_00
...	...
12015	Current value flags FLAG_255..FLAG_240
13000	Current value TIMER_00
...	...
13031	Current value TIMER_31
14000	Current value COUNTER_00
...	...
14031	Current value COUNTER_31
...	...
DATA_20000 ... DATA_20127	COM_0 receiving buffer
DATA_21000 ... DATA_21127	COM_0 transmission buffer
DATA_22000 ... DATA_22127	COM_0 receiving buffer
DATA_23000 ...	COM_0 transmission buffer

DATA_23127	
<b>DATA present in only GTP_128 and TSP_128 models</b>	
DATA_2004	Alarm threshold PID regulator channel 2
DATA_2005	Alarm threshold PID regulator channel 3
DATA_2006	Derivative time PID regulator channel 2
DATA_2007	Derivative time PID regulator channel 3
DATA_2008	Integral time PID regulator channel 2
DATA_2009	Integral time PID regulator channel 3
DATA_2010	Regulation band PID regulator channel 2
DATA_2011	Regulation band PID regulator channel 3
DATA_2012	Cycle time PID regulator channel 2
DATA_2013	Cycle time PID regulator channel 3
DATA_2014	Set Point temperature PID regulator channel 2
DATA_2015	Set Point temperature PID regulator channel 3
DATA_2016	Temperature PID regulator channel 2
DATA_2017	Temperature PID regulator channel 3

## 1.2 System Flags

Each system flag is written as : "SYS\_nn". The SYS are the individual bits (0 or 1) and can be substantially of two types :

- SYS used by the operating system to signal the state of a resource (for example, there are SYS active every second, every minute etc ...)
- or the SYS that must be set by the programmer in order to enable a particular resource of the PLC (for example, the encoder input is not considered a fast input to the encoder if it is not activated on the SYS and so for other resources)

In the second case in question, i.e. the activation of a resource via the setting of a SYS, it is normally performed inside the INITIALIZE subroutine; this because being that subroutine accessed by default from the PLC to the first cycle you will have available the resource in question for the duration of the program.

Into PLC are defined different system flag to make available information relating to the state and to enable / disable some internal resources.

We see the complete map of all the flags of the system :

SYS Name	Description
SYS_00	Always false flag
SYS_01	Always true flag
SYS_02	High only the first program cycle
SYS_03	CMP result , high if the two CMP operands are equal
SYS_04	CMP result , high if OPR_1 < OPR_2
SYS_05	CMP result , high if OPR_1 > OPR_2
x	x
SYS_07	Receiving SMS message "Done"
SYS_08	Transmission of the page written in DATA_22 via SMS to the number DATA_945, DATA_946 / 947
SYS_09	Enable Interrupt input and USER_INT function
SYS_10	Erasing all flags at power on
SYS_11	Fast DAC activation
SYS_12	Write enable seconds of the Real Time Clock on DATA_55 (only if SYS_18 and SYS_12 are active)
SYS_13	High any 15 minutes
SYS_14	Blink (0.5 sec ON and 0.5 sec OFF)
SYS_15	High any 10 msec
SYS_16	High any 100 msec

SYS_17	High any second
SYS_18	Real Time Clock enable ( and of the plugged RAM DATA_432..DATA_511)
SYS_19	Analogic inputs enable
SYS_20	Forcing EEPROM salvage (DATA_22 = start, DATA_23 = stop)
SYS_21	EEPROM salvage of a memory block
SYS_22	Restoration the EEPROM of a memory block
SYS_23	BUZZER enable
SYS_24	Enable PID regulator PWM mode channel 0
SYS_25	Enable PID regulator MODULATION mode channel 0
SYS_26	PID regulator : Output PWM mode or output OPEN MODUL mode channel 0
SYS_27	PID regulator : Output MODUL mode CLOSE channel 0
SYS_28	PID regulator : Ready flag channel 0
SYS_29	PID regulator : Alarm flag channel 0
...	...
SYS_32	Enable PID regulator PWM mode channel 1
SYS_33	Enable PID regulator MODULATION mode channel 1
SYS_34	PID regulator : Output PWM mode or output OPEN MODUL mode channel 1
SYS_35	PID regulator : Output MODUL mode CLOSE channel 1
SYS_36	PID regulator : Ready flag channel 1
SYS_37	PID regulator : Alarm flag channel 1
...	...
SYS_40	Enable encoder 0 mono-directional (DATA_994/995)
SYS_41	Enable encoder 0 bidirectional
SYS_42	Enable automatic reset encoder 0 (with value DATA_992/993 )
SYS_43	Output automatic reset encoder 0
SYS_44	Enable encoder 1 mono-directional (DATA_996/997)
SYS_45	Enable encoder 1 bidirectional
SYS_46	Enable automatic reset encoder 1 (with value DATA_998/999)
SYS_47	Output automatic reset encoder 1
SYS_48	Output step motor 0 generator
SYS_49	Step motor 0 placement under execution
SYS_50	Step motor 0 placement finish
SYS_51	COM_0 reading command
SYS_52	COM_0 writing command
SYS_53	COM_1 reading command
SYS_54	COM_1 writing command
SYS_55	Enable electric cams generator
SYS_56	Enable PWM generator channel 0
SYS_57	Enable PWM generator channel 1
SYS_58	Command EEPROM salvage recipe
SYS_59	Command recipe restoration from EEPROM
SYS_60	Enable COM_0 print (DATA_22=start page, DATA_23=stop page)
SYS_61	Enable COM_1 print (DATA_22=start page, DATA_23=stop page)
SYS_62	Enable COM_0 string transmission (DATA_22=start DATA, DATA_23=stop DATA)
SYS_63	Enable COM_1 string transmission (DATA_22=start DATA, DATA_23=stop DATA)
SYS_64	Enable Timer 1 millisecond on DATA_64
...	...
SYS_71	Enable Timer 1 millisecond on DATA_71
...	...



SYS_78	Rx PLC COM External
SYS_79	Enable Weekly-Programs
SYS_80	State weekly program n. 1
...	...
SYS_95	State weekly program n. 16
SYS_96	Output step motor 1 generator
SYS_97	Step motor 1 placement under execution
SYS_98	Step motor 1 placement finish
SYS_100	Analog activation AD7730 - channel 0 (only GTP_128)
SYS_101	Analog activation AD7730 - channel 1 (only GTP_128)
SYS_102	Analog activation AD7730 - channel 2 (only GTP_128)
SYS_103	Analog activation AD7730 - channel 3 (only GTP_128)
SYS_104	Activation of the reset of the AD7730 converter for load cells (GTP_128)
SYS_105	COM_2 reading command
SYS_106	COM_2 writing command
SYS_107	Activation of the PID controller Channel 0 DC motor DAC output
SYS_109	Activation of the PID controller Channel 0 asynchronous motor (inverter DAC output)
SYS_111	Activation of the PID controller Channel 0 step motor
SYS_113	Activation of the PID controller Channel 0 PWM of the PM100 (14 bit)
SYS_114	Activation motor Channel 0 of the PM100
SYS_115	Enabling direct management of the PM 100 14-bit PWM (duty cycle of DATA_80 and DATA_81)
SYS_116	Write command double word (32 bits) of COM_0 (see SYS_52)
SYS_118	Write command double word (32 bits) of COM_1 (see SYS_54)
SYS_120	Flag reset serial communication alarms on COM_0, if activated reset errors due to a possible communication error and resets the pointer of the reception buffer
SYS_121	Flag reset serial communication alarms on COM_1, if activated reset errors due to a possible communication error and resets the pointer of the reception buffer
SYS_122	Flag reset serial communication alarms on COM_2, if activated reset errors due to a possible communication error and resets the pointer of the reception buffer

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